

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-26 are pending in the present application, Claims 1-26 having been amended by the present amendment. It is respectfully submitted that no new matter is added by this amendment.

In the outstanding Office Action the drawings were objected to as including references signs not mentioned in the description, as not being properly labeled, as using the same reference sign for different mathematical operations, and as including French terminology; the abstract was objected to as not being a single paragraph and including legal phraseology; the disclosure was objected to as including informalities and not including section headings; the claims were objected to as lacking a proper introduction; Claims 1 and 2 were objected to as including informalities; Claims 5-26 were objected to under 37 C.F.R. § 1.75(c) as being in improper form and were not further treated on the merits because a multiple dependent claim cannot depend from any other multiple dependent claim; Claims 2-26 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement; Claims 1-26 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite; Claims 1-3 were rejected under 35 U.S.C. § 102(b) as being anticipated by Hagenauer et al. (U.S. Patent No. 5,761, 248, hereinafter Hagenauer); and Claim 1 was rejected under 35 U.S.C. § 102(e) as being anticipated by Kim et al. (U.S. Patent No. 6,615,385 B1, hereinafter Kim).

Applicants thank Examiner Deppe for the interview granted Applicants' representatives on May 11, 2004. During the interview, how the claimed invention differed from the cited references of record, how claims may be drafted to overcome the outstanding rejections, and a proposed amendment were discussed with regard to the references of record.

In response to the objections to the drawings, substitute Figures 1-4 are submitted herewith, and it is respectfully requested that the objection be withdrawn.

With regard to the objections to the disclosure and abstract, a substitute specification is submitted herewith. The informalities addressed in paragraphs 6 and 7 of the outstanding Office Action have been corrected, and the abstract has been amended. It is respectfully submitted that no new matter is added by the substitute specification, and that the objection is overcome.

In response to the objections to the claims, a proper introduction has been included before the claims. Claims 1 and 2 have been amended as suggested in paragraph 9 of the outstanding Office Action, and Claims 5-26 have been amended to delete the multiple dependency of claims. No new matter is added by the amendments, and it is respectfully requested that the objections be withdrawn.

Briefly recapitulating, the digital transmission method with error correcting coding as in amended Claim 1 includes a “generating a characteristic quantity from each set of said weighted output information items generated by each of said elementary decoding steps during each iteration that is characteristic of said set of weighted output information items.” The characteristic quantity is then compared with a threshold quantity and the iterative decoding is interrupted when the characteristic quantity reaches the threshold quantity.¹ As a result of generating the characteristic quantity from each set of weighted output information generated by each elementary decoding step, the iterative decoding method can be interrupted at an elementary decoding step within each iteration as soon as a desired result is reached because successive elementary decoding steps are not required to calculate the characteristic

¹ Applicants' specification at least at page 8, lines 27-30.

quantity.² The transmission efficiency of the method is also increased since the characteristic quantity is generated after transmission.

Further, Claims 1 and 2 have been amended consistent with the specification to clarify the claimed invention and address the 35 U.S.C. § 112, first paragraph, rejection regarding generating a characteristic quantity stated in paragraph 13 of the outstanding Office Action.³ The characteristic quantity is characteristic of a set of weighted output information items. As disclosed in the specification, a weighted output information item is a combination of systematic information and extrinsic information.⁴ Further, amended Claim 2 recites that “said generating step comprises: calculating a quantity characteristic of a set of extrinsic information.” The generating step in both Claim 1 and Claim 2 generates a characteristic quantity characteristic of a set of weighted output information, and Claim 2 simply clarifies how to calculate the quantity that is characteristic of the set of weighted output information. Support for the amendment and further explanation is disclosed in the specification at least at page 9, lines 5-15. It is respectfully submitted that the rejection is overcome.

Similarly, Claims 1-4 have been amended to clarify the claimed invention and overcome the 35 U.S.C. § 112, second paragraph rejections. Specifically, Claim 1 has been amended consistent with the specification to clarify that the elementary coding steps operate in series or in parallel.⁵ Claims 1, 2, and 4 have been amended to clarify the step of generating a characteristic quantity. Claims 1 and 2 have been amended as discussed above, and Claim 4 has been amended to clarify that generating characteristic quantity in Claim 4 includes “calculating a mean of an absolute value of said set of weighted output information items generated from each of said elementary decoding steps within each iteration.” Support

² Applicants’ specification at least at page 17, lines 5-10.

³ Applicants’ specification at least at page 9, lines 5-10.

⁴ Applicants’ specification, page 15, line 17 to page 16, line 33.

⁵ Applicants’ specification at least at page 8, lines 20-27.

for amended Claim 4 is found at least at page 17, lines 1-25. No new matter is added by the amendments, and it is respectfully requested that the rejection be withdrawn.

Addressing now the prior art rejections, Hagenauer is directed towards a method for determining an adaptive abort criterion comparing a calculated quantity that evaluates a difference in the results of decoding one or more different sub-iterations.⁶ Hagenauer specifically describes, aborting said decoding when a threshold quantity is greater than a relative entropy that is calculated from a first weighted decision from a current iteration step and a second weighted decision from a combination of sub-results of preceding iteration sub-steps.⁷ The sub-iterations in Hagenauer are similar to the elementary decoding steps described in amended Claim 1. The iterative decoding in Hagenauer is not interrupted until the output is stagnant for two successive sub-iterations. Therefore, the desired decoding result is actually obtained during the previous sub-iteration. Hagenauer describes calculating a quantity value based on successive sub-iterations, but does not disclose generating a characteristic quantity “from each set of said weighted output information items generated by each of said elementary decoding steps during each iteration” as in amended Claim 1. Therefore, Hagenauer does not disclose each and every element of amended Claim 1, and it is respectfully submitted that the rejection is overcome.

Kim is directed towards an iterative decoder and decoding method in which the output of each component decoder is checked for the presence or absence of errors.⁸ Kim discloses a Cyclic Redundancy Code (CRC) check for determining the presence of errors after each component decoder.⁹ A CRC must be introduced on transmission, which reduces the overall efficiency of the channel coder. As stated above, amended Claim 1 recites “generating a characteristic quantity from each set of said weighted output information items generated by

⁶ Hagenauer, column 4, lines 1-15.

⁷ Hagenauer, column 4, line 48 to column 5, line 3.

⁸ Kim, column 2, lines 13-20.

⁹ Kim, column, Figure 3.

each of said elementary decoding steps.” The characteristic quantity in amended Claim 1 is generated from each set of weighted information items generated during decoding, and therefore, the characteristic quantity is generated after transmission. The CRC transmitted over a channel is not generated “from each set of said weighted output information items generated by each elementary decoding step,” since at the very least the CRC is generated prior to transmission, reception, and decoding. Thus, the CRC of Kim is not equivalent to the characteristic quantity generated after transmission. Therefore, Kim does not disclose every element of the amended Claim 1. It is respectfully submitted that this rejection is overcome.

Likewise, it is respectfully submitted that dependent Claims 2-26 are allowable for at least the same reasons as discussed above with respect to parent Claim 1.

Consequently, in view of the present amendment and in light of the above discussion, the application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Eckhard H. Kuesters
Attorney of Record
Registration No. 28,870

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 08/03)
EHK/SAE:sih

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